

# Notice of Allowability

Application No.

09/737,942

Examiner

Matthew J. Sked

Applicant(s)

KARTTUNEN ET AL.

Art Unit

2655

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 08/05/05.
2. ☒ The allowed claim(s) is/are 1-20.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All b) ☐ Some\* c) ☐ None of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

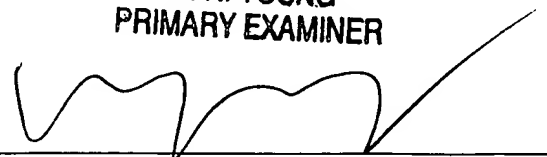
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

## Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

W. R. YOUNG  
PRIMARY EXAMINER



## **DETAILED ACTION**

### ***Response to Amendment***

1. The rejection of claims 1-20 under 35 USC 101 is withdrawn in view of the amendment filed 08/05/05.

## **EXAMINER'S AMENDMENT**

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows: In claim 15, delete "and" following the fifth limitation of the claim, *line 15.*

### ***Allowable Subject Matter***

3. Claims 1-20 are allowed.
4. The following is an examiner's statement of reasons for allowance: Claims 1 and 15 recite the combination of producing an input finite state network that has a set of paths with at least one of those paths containing a delimited subpath where the delimited subpath encodes on an indicated side a delimited substring formatted as a regular expression, creating a first temporary finite-state network by extracting the delimited subpath from the input finite state network and eliminating the symbols on the indicated side of the delimited subpath, creating a second temporary finite state network

by compiling the delimited substring formatted as a regular expression, computing the cross product between the first and second temporary finite state networks to produce a resulting finite-state network that is used to replace the delimited substring in the input finite-state network to produce an output finite-state network.

Kempe (PCT Pub. WO 99/01828) teaches compiling finite state transducers for speech by providing an incomplete set of class sequences, tagging the class sequences using a HMM to produce a tag sequence of a first type, providing a set of tag sequences of a second type and combining the two sets of tag sequences to build a FST (claim 5).

Chung et al. (U.S. Pat. 6,278,973) teaches a method of on-demand finite-state automata composition that supports creating new networks from an initial network by combining network machines or creating arcs between unconnected states (col. 7, line 44 to col. 8, lines 31).

Kiraz ("Multitiered Nonlinear Morphology Using Multitape Finite Automata: A Case Study on Syria and Arabic"), cited by the applicant, teaches creating a finite state network for each entry in a lexicon and computing the cross product of all the finite state networks to create a finite state network for the entire lexicon (section 4.1, page 86).

It would not have been obvious to one of ordinary skill in the art at the time of invention to modify the systems of Kempe, Chung and Kiraz to arrive at the applicant's invention.

5. Claims 2-14 and 16-20 are allowed because they further limit the claims to which they refer.

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Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Beesley et al. ("Finite-State Non-Concatenative Morphotactics"), published by the same inventive entity, teaches replacing subpaths in a FSN by using an intersection of two temporary paths. Karttunen ("Directed Replacement"), Bouma ("A Finite State and Data-Oriented Method for Grapheme to Phoneme Conversion") and Reape et al. ("Parallel Intersection and Serial Composition of Finite State Transducers") teach building Finite State Networks by computing the intersection of other networks.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Sked whose telephone number is (571) 272-7627. The examiner can normally be reached on Mon-Fri (8:00 am - 4:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on 571-272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MS  
10/19/05



W. R. YOUNG  
PRIMARY EXAMINER